REMARKS

The foregoing amendments are responsive to the January 26, 2007 Office Action. Applicant respectfully request reconsideration of the present application in view of the foregoing amendments and the following remarks.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Response to Rejection of Claim 39 Under 35 U.S.C. 112, Second paragraph

The Examiner rejected Claim 39 under 35 U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Claim 39 has been amended to more particularly point out and distinctly claims the subject matter Applicant regards as the invention.

Response to Rejection of Claims 1-22, 34-37 and 39-54 Under 35 U.S.C. 101

The Examiner rejected Claims 1-22, 34-37 and 39-54 under 35 U.S.C. 101 because the invention disclosed in the claims are directed to non-statutory subject matter.

Applicant argues that the data compression produced by the claimed method provides a practical application, namely, a reduction in computer storage and/or memory requirements. This practical application is useful when used in conjunction with computing and/or with a computing system.

Response to Rejection of Claims 1-21, 34-37 and 40-54 Under 35 U.S.C. 102(b)

The Examiner rejected Claims 1-21, 34-37 and 40-54 under 35 U.S.C. 102(b) as being anticipated by Canning et al., Rockwell Inst. Sci. Center, "Fast Direct Solution of Standard Moment-Method Matrices," IEEE Antennas and Propagation Magazine, June 1998, pages 15-26, hereafter referred to as Rockwell.

The Examiner argues: "Accordingly, Applicant admitted the matrix method used to find composite sources and composite testers can be a rank-revealing factorization such as singular value decomposition and specifically referred to Rockwell's Lanczos Bi-diagonalization

method..... If one of ordinary skill in the art cannot apply Rockwell's teaching to practice the claimed limitations of reducing matrix rank a potential enablement issue may be raised."

Applicant has previously argued (Both in the response of May 19, 2006 and in the response of November 13, 2006) that, in the case where reducing a rank is a common feature, there are still a number of other distinguishing features of Applicant's invention from "Rockwell." The Office Action of August 24, 2006 and the current Final Office Action do not appear to consider these arguments.

First thread of arguments and responses:

In the Office Action Response mailed May 19, 2006. Applicant stated, on Page 12, that

> "Rockwell does or teach or suggest that a second set of basis functions and a second set of weighting functions are to be obtained by separate rank reductions."

In the Office Action of August 24, 2006. Examiner acknowledged Applicant's statement above, quoting it on Page 14 and labeling it as Applicant's argument (3). Nevertheless, although on Page 15 the Examiner gave responses to the Applicant's arguments (1-2) and (4-8), the Examiner did provide a response to argument (3).

In the Office Action mailed August 24, 2006, in Section 9-20 on Page 10, the Examiner stated,

> "Regarding claim 35, Rockwell further discloses N is greater than one and M is greater than one (SVD is used to calculate the low-rank approximation to block **A** and from equation (3) at page 16, left column, each row or column of matrix D is a linear combination of corresponding rows or columns of matrix **A**)."

In the Office Action Response mailed November 13, 2006, on Page 14, Applicant replies to these comments, stating,

> "Applicant understands Examiner's response to mean that, according to the teachings of Rockwell, the matrix **A** may have both its first and second

dimensions greater than one. However, even if the first and second dimensions are greater than one, Rockwell still teaches a single rank reduction. By contrast, Claim 1 recites a first rank reduction to find a linear combination of sources and a second rank reduction to find linear combination of testers."

"Rockwell does not teach or suggest that a second set of basis functions and a second set of weighting functions are to be obtained by separate rank reductions. When M and N are both greater than one (see e.g. claim 35), these rank reductions are both non-trivial."

"In Rockwell, Equation (4) on Page 17 showed a method for compressing a sub-matrix **A**. Using A, a pair of interdependent basis functions and testing functions was computed using a single rank reduction and these interdependent basis and testing functions were then used together to compress **A**. These interdependent basis and testing functions were not computed from different rank reductions or from different data."

Apparently in response, the Examiner made the statement discussed above which implied that since both Rockwell and the current invention may use a rank reduction they must be the same method. Thus, the rejection does not appear to consider the distinction argued by Applicant.

In the Office Action mailed December 19, 2005, on page 17, the Examiner quoted two of Applicant's arguments:

(1) "Rockwell teaches using a known prior-art technique of employing a single SVD rank reduction on a rectangular array of data to compress the array. It was known previously that composite sources and composite testers that are created by a single SVD applied to a given rectangular array of data can then be used to compress that same array of data (page 14, paragraph 6, (Amendment).

(2) "The present application teaches that one can use a first rank reduction on a first set of data to obtain composite sources, and a second rank reduction on a second (and different) set of data to obtain composite testers, and then use these separately-computed composite sources and composite testers together to compress a third set of data. The third set of data is not identical to at least one of the first and second sets of data." (page 14, paragraph 7, Amendment).

On page 18 the Examiner responded to these arguments by stating:

> 11-1 Applicant's arguments (1)-(2) are not persuasive. Rockwell discloses, in section 2, Z is the MoM matrix and **A** is a sub-matrix of Z representing the interaction of two regions, which are not physically close to each other. The SVD of **A** is considered for calculating a low-rank approximation to each block **A**. Also, from equation (3) at page 16, left column, each row or column of matrix **D** is a linear combination of corresponding rows or columns of matrix **A**. Accordingly, it is very clear that each block **A** has its own corresponding data set that is not identical to the data set of MoM matrix Z.

In the Office Action Response mailed November 13, 2006, on Page 12, Applicant discussed the above statement of Examiner, and argued:

> "This equation appears to be inconsistent with Examiner's statement that "...each row or column of matrix D is a linear combination of corresponding rows or columns of matrix A" (See, e.g. the Office Action mailed 12/19/1005 in 11-1, Page 18, and the current Office Action in 9-1, Page 5, in 9-10, Pages 8 and 9, and in 9-20, on Page 10.)

In the present Final Office Action, the Examiner repeated this statement (see 7-20 on Page 10), but does not respond to our argument regarding the matrix D. Nevertheless, the Applicant wishes to respond to the Examiner's related statement (from December 19, 2005, Page 18), "Accordingly, it is very clear that each block A has its own corresponding data set that is not identical to the data set of MoM matrix Z." Applicant has argued that a novel feature of the present invention lies in using different data to compute composite sources than to compute composite testers. Examiner appears to be raising a different issue; an issue regarding a difference between data in A and in a larger MoM matrix.

More particularly, a distinguishing feature of the present invention is that,

> "...for at least a portion of the transformed equation, using a composite source and a composite tester, that composite source and composite tester were found using data that is a least partially different." (*see* Applicant's response mailed November 13, 2006, on Page 14)

Applicant argues that there is a difference in the data used in finding a composite source and in finding a composite tester and that this is a distinguishing feature from Rockwell.

Second Thread of arguments and responses discusses a special case

In the Office Action Response mailed May 19, 2006, Applicant stated (pages 12-13),

> "For Claim 1 when M is one, the teachings of Rockwell would produce a matrix with a dimension of 1 by p as a product of itself and a vector of length one, which is trivial. Rockwell does not teach or suggest a rank reduction on a 1 by p matrix. Claim 1 recites reducing a rank of said matrix of transmitted disturbances to yield a second set of basis functions. This reducing a rank is non-trivial since N is greater than one when M is one."

In the Office Action mailed August, 24, 2006, the Examiner responded to this in Section 11-3 on Page 15, stating:

> "When M is one or N is one the SVD of A still meet the claimed limitation of reducing matrix rank and yield composite sources or testers by selecting the largest elements of the matrix. Elements with smaller value transmitting or receiving weakly."

In the subsequent Office Action Response mailed November 13, 2006, Applicant argues on Page 12, that:

> "The present application teaches how to produce results other than those of Rockwell. For example, in the case of the one by three matrix **A** discussed above, reducing a rank using an SVD or using other methods can produce three or more non trivial vectors, any of which can be used."

This is clearly a different result from Rockwell's "product of a column vector of length one times a number times a row vector of length three."

In the subsequent Final Office Action mailed January 26, 2007, the Examiner labeled Applicant's argument above as (4), and did not respond to Applicant's assertion that the result produced by the present invention was different from the result Rockwell would produce.

Rather, in 9-4, Examiner argued that both Rockwell and the current invention make use of the same or similar mathematical methods. However, the rejection does not take into consideration the fact that these methods are applied in a different manner. The rejection does not appear to show consideration of the example presented by Applicant to distinguish Rockwell. In the example, Applicant describes three vectors produced by the claimed invention where the invention of Rockwell could produce only one.

Moreover, in the Office Action Response mailed November 13, 2006, Applicant also offered a second response to Examiners objections in the last two paragraphs of Page 13. Namely, that:

> "When N is greater than one, neither using this exact one-term expansion nor approximating A by zero produces "said second set of basis functions comprising a linear combination of a number N of said original basis functions," since no new basis functions are produced. When M is greater than one, neither using this exact one term expansion nor approximating **A** by zero produces "said second set of weighting functions comprising a linear combination of a number M of said original testers," since no new functions are produced.
>
> "Applicant notes that in the current Office Action, Examiner stated, 'When M is one or N is one, the SVD of **A** still meets the claimed limitation of reducing matrix rank and yield composite sources or testers by selecting the largest elements on the matrix." Applicant argues that simply approximating matrix elements by zero (i.e., zeroing the elements not selected) does not yield the functions that would create the zero matrix elements. Claim 1 recites "to yield a second set of weighting functions" and "to yield a second set of basis functions." When either M or N is greater than one, one of these sets of functions must be different from the first set of function."

The Final Office Action mailed January 26, 2007 does not appear to respond to this argument.

In view of the arguments and distinctions provided by Applicant, Applicant does not understand the basis for the rejection of Claims 1-22, 34-37, and 39-54. Applicant respectfully asserts that Claims 1-22, 34-37, and 39-54 describe patentable subject matter and are allowable over the prior art. Applicant respectfully requests allowance of Claims 1-22, 34-37, and 39-54, or in the alternative, further consideration and clarification of the basis for rejecting the claims.

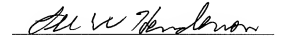
Summary

Applicant respectfully assert that Claims 1-22, 34-37, and 39-54 are allowable over the prior art, and Applicant request allowance of Claims 1-22, 34-37, and 39-54. If there are any remaining issues that can be resolved by a telephone conference, the Examiner is invited to call the undersigned attorney at (949) 721-6305 or at the number listed below.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: March 26, 2007

By: 

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